Spring 1-1-2020

MET 235-002: Statics for Technology

Alex Adesman

New Jersey Institute of Technology
Department of Engineering Technology
MET 235 Statics for Technology

COURSE NUMBER	MET 235
COURSE NAME	Statics for Technology
COURSE STRUCTURE	3-0-3 (lecture hr/wk - lab hr/wk – course credits)
COURSE COORDINATOR/ INSTRUCTOR	Dr. Arijit Sengupta / Alexander Adesman
COURSE DESCRIPTION	Provides an understanding of equilibrium of particles and rigid bodies subject to concentrated and distributed forces. Upon successful completion of this course, the students should be able to analyze problems involving the equilibrium of particles and rigid bodies, including simple machines, trusses, and frictional forces.
PREREQUISITE(S)	Phys 102 and Math 238
COREQUISITE(S)	None
REQUIRED, ELECTIVE OR SELECTED ELECTIVE	Required
REQUIRED MATERIALS	**Vector Mechanics for Engineers, 12th Ed.** by F.P. Beer, E.R. Johnston, Jr., and D.F. Mazurek, ISBN: 9781259977268
COMPUTER USAGE	Microsoft Office
COURSE LEARNING OUTCOMES (CLO)	By the end of the course students should be able to: 1. Perform standard vector operations including addition, subtraction, Dot and Cross products 2. Resolve vectors into components along prescribed directions. 3. Perform equilibrium analysis of rigid bodies. 4. Determine equivalent systems of forces and couples. 5. Perform equilibrium and structural analysis of trusses and frames. 6. Determine centroids and moments of inertia of various areas. 7. Perform equilibrium analysis of impending motion including frictional forces.
CLASS TOPICS	Units, Fundamentals, Force Vectors, Unit Vectors, Equilibrium of a Particle, Forces in Space, Rectangular Components, Equilibrium Rigid Bodies, Equivalent Force Systems, Moments, Couple Systems, Equiv. Force-Couple Systems, Equilibrium of a Rigid Body, Distributed Forces,

Trusses, Frames, Machines, Centroids, Center of Gravity, Moment of Inertia, Polar Moments of Inertia, Friction and Belt Friction

STUDENT OUTCOMES

The Course Learning Outcomes support the achievement of the following MET Student Outcomes and TAC of ABET Criterion 9 requirements:

Student Outcome b - an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;
Related CLO – 1 thru 7

GRADING POLICY

Homework and Class Participation	15 %
Tests (3 @ 18% ea.)	54 %
Final Exam	31 %

NOTE: GRADING POLICY MAY BE MODIFIED BY INSTRUCTOR FOR EACH SECTION IN THE COURSE)

There are three tests during the semester. The lowest grade will be dropped. However, if you achieve an A for all three tests, you will not be excused from the final. There will be no makeup tests – if you miss one test, then that is the test you will drop.

Homework is due at the beginning of the class period, one week after it is assigned. Late homework will be penalized one problem grade per week and not accepted after graded homework has been returned.

1. Homework must be submitted in sets, arranged in order as in course outline. Sets must be stapled together in the upper left hand corner.
2. Homework problems should be done using the "Given and Find" format and all equations should be defined symbolically prior to calculating any values. DO NOT HAND IN class notes or scratch work.

ACADEMIC INTEGRITY

NJIT has a zero-tolerance policy regarding cheating of any kind and student behavior that is disruptive to a learning environment. Any incidents will be immediately reported to the Dean of Students. In the cases the Honor Code violations are detected, the punishments range from a minimum of failure in the course plus disciplinary probation up to expulsion from NJIT with notations on students' permanent record. Avoid situations where honorable

behavior could be misinterpreted. For more information on the honor code, go to http://www.njit.edu/academics/honorcode.php

STUDENT BEHAVIOR	• No eating or drinking is allowed at the lectures, recitations, workshops, and laboratories. • Cellular phones must be turned off during the class hours – if you are expecting an emergency call, leave it on vibrate. • No headphones can be worn in class. • Unless the professor allows the use during lecture, laptops should be closed during lecture.
MODIFICATION TO COURSE	The Course Outline may be modified at the discretion of the instructor or in the event of extenuating circumstances. Students will be notified in class of any changes to the Course outline.
PREPARED BY	Alexander Adesman
COURSE COORDINATED BY	Dr. A. Sengupta

CLASS HOURS

Monday	1:00 PM – 2:20 PM	CKB 207
Wednesday	1:00 PM – 2:20 PM	CKB 207

OFFICE HOURS:

By Appointment: alex.adesman@njit.edu

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GRADING LEGEND

GRADE	NUMERIC RANGE
A	90 to 100
B+	85 to 89
B	80 to 84
C+	75 to 79
C	70 to 74
D	60 to 69
F	0 to 59

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MET 235 - COURSE OUTLINE

WEEK	DATE	TOPICS	SECTIONS	ASSIGNMENTS
1	Jan 22 Jan 27	Introduction: Units, Concepts, Fundamentals	1.1 thru 1.6	
2	Jan 29 Feb 3	Force Vectors, Unit Vectors, Equilibrium of a Particle	2.1 thru 2.3	2.1,4,5,6,8,23, 24,35,46
3	Feb 5 Feb 10	Forces in Space: Rectangular Components, Equilibrium	2.4 thru 2.5	2.70,107
4	Feb 12 Feb 17	Quiz 1 - Rigid Bodies: Equivalent Force Systems, Moments	3.1 thru 3.2	3.2,3,7,9,16,17,25
5	Feb 19 Feb 24	Couple Systems	3.3	3.71,73,74,97
6	Feb 26 Mar 2	Equiv. Force-Couple Systems	3.4	3.101,105,113
7	Mar 4 Mar 9	Equilibrium of a Rigid Body	4.1 thru 4.3	4.10,15,19,25,29, 33
8	Mar 11 Mar 23	Centroids and Center of Gravity Quiz 2	5.1 thru 5.2	5.1,3,6,7

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SPRING BREAK 3/15-3/22				
9	Mar 25 Mar 30	Distributed Forces	5.3 and 5.4	5.66,68,70,71
10	Apr 1 Apr 6	Structural Analysis: Trusses	6.1 thru 6.2	6.1,6,8,14,44,53
11	Apr 8 Apr 13	Structural Analysis: Frames and Machines	6.3 thru 6.4	6.79,82,85,140, 148
12	Apr 15 Apr 20	Quiz 3 - Moment of Inertia and Polar Moments of Inertia	9.1 thru 9.2	9.31,32,40,52
13	Apr 22 Apr 27	Moment of Inertia Polar Moments of Inertia	9.3 thru 9.6	9.71, 75,77
14	Apr 29 May 4	Friction and Belt Friction	8.1, 8.4	8.1,3,11
15	TBD	Final Exam		